

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled).
2. (Currently Amended) ~~The torque computation unit according to claim 1, A~~
torque computation unit of a vehicle generator that includes a rotor, an armature winding, a field coil and a field current switching element, the torque computation unit comprising:
field current detecting means for detecting a field current value relating to current supplied to the field coil;
output current detecting means for detecting an output current value relating to output current of the armature winding;
rotation speed detecting means for detecting a rotation speed of the rotor; and
torque calculation means for calculating driving torque of the generator from the field current value, the output current value and the rotation speed,

wherein said field current detecting means calculates the field current value from voltage applied to the field coil and an on-off ratio of the field current switching element.

3. (Cancelled).
4. (Currently Amended) ~~The torque computation unit according to claim 1, A~~
torque computation unit of a vehicle generator that includes a rotor, an armature winding, a field coil and a field current switching element, the torque computation unit comprising:
field current detecting means for detecting a field current value relating to current supplied to the field coil;
output current detecting means for detecting an output current value relating to output current of the armature winding;

rotation speed detecting means for detecting a rotation speed of the rotor;
torque calculation means for calculating driving torque of the generator from
the field current value, the output current value and the rotation speed; and further comprising
a solenoid disposed around an end of the armature winding,
wherein said output current detecting means calculates the output current value
from voltage applied to the solenoid.

5. (Currently Amended) ~~The torque computation unit according to claim 1, A~~
torque computation unit of a vehicle generator that includes a rotor, an armature winding, a
field coil and a field current switching element, the torque computation unit comprising:
field current detecting means for detecting a field current value relating to
current supplied to the field coil;
output current detecting means for detecting an output current value relating to
output current of the armature winding;
rotation speed detecting means for detecting a rotation speed of the rotor;
torque calculation means for calculating driving torque of the generator from
the field current value, the output current value and the rotation speed; and further comprising
a C-shaped magnetic core having a slit and a magnetic sensor inserted in the
slit, wherein said output current detecting means calculates the output current value from an
output signal of said magnetic sensor.

6. (Cancelled).

7. (Currently Amended) ~~The torque computation unit according to claim 1, A~~
torque computation unit of a vehicle generator that includes a rotor, an armature winding, a
field coil and a field current switching element, the torque computation unit comprising:
field current detecting means for detecting a field current value relating to
current supplied to the field coil;

output current detecting means for detecting an output current value relating to output current of the armature winding;

rotation speed detecting means for detecting a rotation speed of the rotor;

torque calculation means for calculating driving torque of the generator from the field current value, the output current value and the rotation speed; further comprising

a memory which stores data of moment of inertia of the rotor; and

means for calculating an acceleration velocity of the rotation speed from voltage induced in the armature winding,

wherein said torque calculation means calculates inertial torque of the generator from the acceleration velocity and the moment of inertia of the rotor.

8. (Currently Amended) The torque computation unit according to claim 1, A torque computation unit of a vehicle generator that includes a rotor, an armature winding, a field coil and a field current switching element, the torque computation unit comprising:

field current detecting means for detecting a field current value relating to current supplied to the field coil;

output current detecting means for detecting an output current value relating to output current of the armature winding;

rotation speed detecting means for detecting a rotation speed of the rotor;

torque calculation means for calculating driving torque of the generator from the field current value, the output current value and the rotation speed,

wherein said field current detecting means further comprises means for detecting temperature of the field coil, and

wherein said field current detecting means calculates the field current value from voltage applied to the field coil, an on-off ratio of the field current switching element and the temperature of the field coil.

9. (Previously Presented) The torque computation unit according to claim 2, wherein said field current switching element is a MOSFET.
10. (Previously Presented) The torque computation unit according to claim 2, wherein said rotation speed detecting means calculates the rotation speed from the basic frequency of voltage induced in said armature winding.

11. (Currently Amended) A torque computation unit of a vehicle generator that includes a rotor, an armature winding, a field coil and a field current switching element, the torque computation unit comprising:

field current detecting means for detecting a field current value I_r ;

output current detecting means for detecting an output current value I_o of the armature winding;

rotation speed detecting means for detecting a rotation speed N of the rotor;

and

torque calculation means for calculating driving torque T of the generator from the field current value I_r , the output current value I_o , and the rotation speed N from the following equation:

$$T = (k_1 \cdot I_r^2 + M \cdot I_r \cdot I_o + I_o^2) / N \quad T = (k_1 \cdot I_r^2 + M \cdot I_r \cdot I_o + k_2 \cdot I_o^2) / N, \text{ wherein}$$

k_1 is a constant relating to a self-inductance of said field coil, M is a constant relating to a mutual inductance between said field coil and said armature winding and k_2 is a constant relating to a self-inductance of said armature.